What is claimed is:

1. A liquid-cooled vehicle rotary electric machine operable in a motor mode or a generator mode comprising:

a frame having an inner periphery and a liquid passage;

a stator core having an outer periphery fixedly fitted to said inner periphery of said frame and a plurality of slots;

a multi-phase stator winding accommodated in said plurality of slots;

a rotor rotatably supported by said frame and disposed inside said stator core so as to electro-magnetically connect said stator core; wherein

said stator winding comprises a plurality of insulated U-shaped conductor segments each of which has a pair of legs, and

each of said legs is inserted in a slot from one end of said stator core and connected to be paired to another at a portion extending from the other end of said stator.

2. The liquid-cooled rotary electric machine as claimed in claim 1 having a space factor more than 55 %, wherein

each of said U-shaped conductor segments comprises a flat wire.

3 3. The liquid-cooled vehicle rotary electric machine as claimed in claim 1, wherein

said stator core and said stator winding are liquid-

tightly enclosed by said frame.

4. The liquid-cooled rotary electric machine as claimed in claim 1, wherein

each of said legs inserted in said plurality of slots is closely fitted to one of said plurality of slot via an insulator.

5. The liquid-cooled vehicle rotary electric machine as claimed in claim 1, wherein

said rotor has a plurality of different magnetic poles alternately disposed at prescribed intervals in the circumferential direction thereof, and

the number of said slots is larger than the product of the number of said magnetic poles and the number of the phases of said stator.

6. The liquid-cooled rotary electric machine as claimed in claim 1, wherein

said stator winding has a plurality of coil ends formed of said U-shaped conductor segments separated from each other,

each of said coil ends is covered by and filled with insulating material, and

said insulating material is closely fitted to said frame.

7. The liquid-cooled rotary electric machine as claimed in claim 1, wherein

said stator winding is supplied with larger current at said motor mode than current generated at said generator mode.